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1. A functional element for use in an electric, an electronic or an optical device, comprising:

a substrate having on an upper surface thereof a plurality of metal oxide needles extending upwardly of the upper surface of said substrate, with their respective central axes arranged substantially in parallel with each other,

10 said needles having a weighted average circle-based diameter of from 0.01 to 10,000  $\mu\text{m}$ , wherein said weighted average circle-based diameter is defined as the weighted average diameter of circles having areas equal to the areas of the cross-sections of said needles, 15 said cross-sections being taken at the middle portions located at the  $1/2$  lengths of said needles and along a plane perpendicular to the central axes of said needles,

20 said needles having a weighted average aspect ratio of 0.1 or more, wherein said weighted average aspect ratio is defined as the ratio of the weighted average length of the needles to said weighted average circle-based diameter of the needles,

25 said needles being present at a density of from 0.01 to 10,000 needles per unit area having a size of

10  $\mu\text{m} \times 10 \mu\text{m}$  at the upper surface of said substrate.

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5 2. The functional element according to claim 1,  
wherein said metal oxide needles are secured to each  
other by means of at least one substance selected from  
the group consisting of an organic substance, an inor-  
ganic substance and a metal.

10 3. The functional element according to claim 1, which  
is an electron emission element for use in an electric  
or an electronic device.

15 4. The functional element according to claim 1, which  
is a capacitor element for use in an electric or an  
electronic device.

20 5. The functional element according to claim 1, which  
is a memory element for use in an electric or an elec-  
tronic device.

25 6. The functional element according to claim 1, which  
is a sensor element for use in an electric or an elec-  
tronic device.

7. The functional element according to claim 1, which

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is a laser emission element for use in an optical device.

8. The functional element according to claim 1, which is an optical switch element for use in an optical device.

9. A method for producing a functional element for use in an electric, an electronic or an optical device, which comprises:

(a) gasifying at least one metal compound having volatilizability or sublimability and having the capability to react with at least one oxide-forming substance to form a metal oxide corresponding to said metal compound, to thereby obtain a metal compound gas, and

(b) applying the obtained metal compound gas onto a surface of a substrate which is placed in a reaction zone containing said oxide-forming substance and which is heated to a temperature higher than the temperature of said metal compound gas, to thereby contact the surface of said substrate with said metal compound gas in the presence of said oxide-forming substance for a period of time sufficient to grow a plurality of metal oxide needles on the surface of said substrate and form

the functional element of claim 1.

10. The method according to claim 9, wherein, in step (b), said metal compound gas is applied together with a carrier gas.

11. The method according to claim 9, wherein said reaction zone contains air at atmospheric pressure.

12. The method according to claim 9, wherein the metal moiety of said metal compound is comprised of at least one element selected from the group consisting of elements belonging to Groups 1 to 15 of the Periodic Table, exclusive of hydrogen, boron, carbon, nitrogen, phosphorus and arsenic.

13. The method according to claim 9, wherein the metal moiety of said metal compound is comprised of at least one element selected from the group consisting of zinc, silicon, aluminum, tin, titanium, zirconium and lead.